

## **3.9 Rare Plants**

### *Introduction*

An evaluation of threatened species, endangered species, sensitive species, plant species of concern, and Forest plant species of concern was conducted for the Como FHP Project in order to determine species of rare plants most likely to be affected by the proposed activities.

### *Summary of Effects*

Due to implementation taking place during the growing season for all rare plant species, certain habitat types may be affected from project implementation. Although there is regular disturbance that takes place at this recreation area, the majority of disturbance occurs in campgrounds and along trails while these plant sites are found off trails (except for one population that has upper rock creek trail going through it) and out of the way from recreation activities. Project implementation may hinder or eliminate the chances of any rare plant species establishing themselves within that habitat for several years in places such as skid trails, especially temp roads and landings.

Design features and mitigation measures will eliminate direct effects to sensitive plant sites and minimize effects to rare plant habitat found in the project area. Therefore, implementation would not contribute to the listing of sensitive vascular plants and non-vascular sensitive plant species.

Alternative 1 (No Action) has no activities planned in areas where rare plant populations and potentially suitable rare plant habitat occur. Based on this information, it is anticipated that implementation of the no action alternative "may impact habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species".

### *Action Alternatives*

Based on the analysis, impacts from activities within the analysis area may occur; possibly causing a reduced number of individuals in certain places, but will not cause significant impacts to rare plant populations as a whole. Due to project design features, direct effects would not occur to any known populations of sensitive or species of concern. However, there may be indirect effects that could occur to known populations. There would be direct and indirect effects that would occur to potential habitat for sensitive species, although with project design features, to reduce disturbance and revegetate disturbed areas, those effects would be minimal.

### **3.9.1 Overview of Relevant Laws, Regulations, and Policies**

#### **3.9.1.1 National Forest Management Act of 1976**

The National Forest Management Act of 1976, as amended, directs the Forest Service to provide for diversity of plant and animal communities and requires the development and implementation of a resource management plan for a National Forest.

#### **3.9.1.2 Endangered Species Act**

The Endangered Species Act of 1973, (as amended (16 U.S.C. 1531 *et seq*) Section 2, directs federal agencies to conserve endangered and threatened species and to ensure that actions authorized, funded, or carried out by these agencies are not likely to jeopardize the continued existence of threatened or endangered species, or result in the

destruction or adverse modification of their critical habitats. Within the state of Montana, water howellia (*Howellia aquatilis*), Spalding's catchfly (*Silene spaldingii*), and Ute ladies' tresses (*Spiranthes diluvialis*) are listed as threatened under the Endangered Species Act (USDA, Forest Service 2011a). There are no plants listed as endangered, and whitebark pine (*Pinus albicaulis*) is a candidate for federal listing (USDI, FWS 2011a). Of the species listed or candidate, only whitebark pine occurs on the Bitterroot National Forest. Whitebark pine does not occur within the analysis area. The project area was surveyed and analyzed for habitat and threatened, endangered, and candidate plants to ensure the project does not jeopardize the continued existence of any species. Therefore, this project will be in compliance with the act.

#### 3.9.1.3 National Environmental Policy Act of 1969

The National Environmental Policy Act requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. Impacts to rare plants have been evaluated under four different alternatives and are presented in this document, thereby meeting the National Environmental Policy Act of 1969.

#### 3.9.1.4 Consistency with the Bitterroot Forest Plan and Other Regulatory Direction

The Forest Plan specifies (p. II-21) that vascular plants identified as rare, pending study, or proposed as threatened or endangered will be identified and protected. Stated goals of Forest Service policy (FSM 2670.22 and 2670.32) are to maintain the population viability of sensitive species across their geographic range, implement management practices to ensure that sensitive species do not become threatened or endangered because of Forest Service actions, and minimize impacts to all species whose viability has been identified as a concern. Information on the number of plants required for maintenance of viable populations is not available. Therefore, a conservative approach is taken when determining the effects of management activities. In this project, all of the alternatives would be consistent with the Forest Plan and Forest Service policy.

#### 3.9.1.5 Forest Service Manual 2600 Wildlife, Fish and Sensitive Plant Habitat Management

Forest Service Sensitive Species Policy (FSM 2670) directs national forests to assist states in achieving conservation goals for endemic species; complete biological evaluations of programs and activities; avoid and minimize impacts to species with viability concerns; analyze the significance of adverse effects on populations or habitat; and coordinate with states and USFWS. The Forest Service Manual (2670. 5) further defines sensitive species as those plant species identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in numbers, density or habitat capability that would reduce a species distribution. By analyzing the effects on sensitive rare plants through this document, and ensuring that sensitive plants are not trending toward federal listing as a result of project implementation, the project will be in compliance with the manual direction.

### 3.9.2 Existing Condition of the Affected Environment

No plants listed as threatened, endangered, or candidates for listing are found in the Como Forest Health project area and will not be analyzed or discussed in this analysis. Sensitive plants are species, subspecies or varieties of plants whose populations or habitat

capability have current or predicted downward trends (FSM 2670.5). Species of Concern are determined by the State of Montana to be rare or threatened plants or plants with declining populations. Sensitive plants and plant Species of Concern may have a restricted range in Montana, or they may be sparsely distributed over a larger area. Plants designated as 'species of concern' by the Montana Natural Heritage Program (MTNHP) include species that are listed as threatened, endangered, or sensitive by Federal agencies.

The Bitterroot National Forest currently analyzes and manages for 108 species of listed sensitive plants (USDA Forest Service 2011) and three species that are forest species of interest because of tribal interest in these plants. These 111 plants are known, suspected, or have potential to occur on the Bitterroot National Forest, due to habitat being present.

Based on the project methodology, the Forest Botanist compiled a list of rare plant species and forest species of interest, which were known or had the potential to occur in the Como Forest Health project area (Table 3.9- 1). The plant species found during fields surveys in the summers of 2003 and 2010-2013 are bolded and shaded. Table 3.9- 2 lists the species found in the project area and the Montana Natural Heritage Species Rankings are displayed in Table 3.9- 3. The Montana Natural Heritage Species Rankings are a standardized ranking system to denote global (range-wide) and state status (NatureServe 2006). Species are assigned numeric ranks ranging from G1 (highest risk, greatest concern) to G 5 (demonstrably secure), reflecting the relative degree of risk to the species' viability, based on available information.

Stalk-leaved monkeyflower, columbian onion, and scalepod were found in vernal wet seeps or ephemeral streams that are very moist to wet in the spring. These areas are small to large openings, surrounded by ponderosa pine trees and Douglas-fir. Three-angled threadmoss and Magellan's peatmoss are associated with rich fens or bogs, and chaffweed is associated with riparian areas.

**Table 3.9- 1: Surveyed Plants in the Como Forest Health Project Area. Plants found in the project area are in bold.**

SPECIES	COMMON NAME	SPECIES	COMMON NAME
<b>SENSITIVE PLANT SPECIES</b>			
<i>Allium acuminatum</i>	Taper-tip onion	<i>Meesia triquetra</i>	<b>3-Angled threadmoss</b>
<i>Allium parvum</i>	Dwarf onion	<i>Mimulus ampliatus</i>	<b>Stalk-leaved monkeyflower</b>
<i>Athysanus pusillus</i>	Sandweed	<i>Mimulus nanus</i>	Dwarf purple monkey flower
<i>Castilleja covilleana</i>	Rocky Mountain paintbrush	<i>Penstemon lemhiensis</i>	Lemhi penstemon
<i>Clarkia rhomboidea</i>	Common clarkia	<i>Penstemon payettensis</i>	Payette penstemon
<i>Halimolobos perplexa</i>	Perplexed halimolobos	<i>Trifolium eriocephalum</i>	Woolly-head clover
<i>Heterocodon rariflorum</i>	Western pearl-flower	<i>Trifolium gymnocarpon</i>	Hollyleaf clover
<i>Idahoia scapigera</i>	<b>Scalepod</b>		
<b>SPECIES OF CONCERN</b>			
<i>Allium columbianum</i>	Columbian onion	<i>Phascum cuspidatum</i>	Toothed Phascum moss
<i>Centunculus minimus</i>	Chaffweed	<i>Pseudocrossidium obtusulum</i>	Pseudocrossidium moss
<i>Penstemon flavescent</i>	Yellow beardtongue	<i>Sphagnum</i>	Magellan's peatmoss

SPECIES	COMMON NAME	SPECIES	COMMON NAME
		<i>magellanicum</i>	
FOREST SPECIES OF INTEREST			
<i>Camassia quamash</i>	Small camas	<i>Lewisia pygmaea</i> var. <i>nevadensis</i>	Nevada lewisia

**Table 3.9- 2: Plant Species Found in the Project Area and Habitat Descriptions Where They were Found. Plants found in the treatment units are in bold.**

SENSITIVE PLANT SPECIES			
SPECIES	COMMON NAME	POPULATIONS FOUND	STATUS
<i>Idaho scapigera</i>	Scalegod	2	G5/S1
Population 1: Knapweed is present on the same slope, but not within the population. Population 2: Trace amounts of knapweed and cheatgrass were found on the margins of the population.			
<i>Meesia triquetra</i>	3-Angled threadmoss	1	G5/S2
<i>Mimulus ampliatus</i>	Stalk-leaved monkeyflower	1	G4/S1
SPECIES OF CONCERN			
SPECIES	COMMON NAME	POPULATIONS FOUND	STATUS
<b><i>Allium columbianum</i></b>	Columbian onion	6	G3/S1
Population 1: Upper Rock Creek Trail runs right through the middle of the population. Population 2: Trace amounts of knapweed near the population. Population 3: An unauthorized ATV trail is within 100 feet of the population. There are infestations of cheatgrass and knapweed near the population. Population 4: Knapweed is present on the same slope, but not within the population. Population 5: Knapweed and cheatgrass invading the slopes near the area of the lower portion of the population. Population 6: An old skid road runs north of the population that is being used by ATVs. Knapweed and cheatgrass are present.			
<i>Centunculus minimus</i>	Chaffweed	1	G5/S2
<i>Sphagnum magellanicum</i>	Magellan's peatmoss	1	G5/S1

**Table 3.9- 3: Montana Natural Heritage Species Rankings. Species are assigned numeric ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure), reflecting the relative degree of risk to the species' viability, based upon available information.**

G1/S1	At high risk of extinction or extirpation in the state because of extremely limited and/or rapidly declining population numbers, range and/or habitat.
G2/S2	At risk of extinction or extirpation in the state because of very limited and/or potentially declining population numbers, range and/or habitat.
G3/S3	Potential risk of extinction or extirpation in the state because of limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.
G4/S4	Apparently secure, though it may be quite rare in parts of its range, and/or suspected to be declining.
G5/S5	Common, widespread, and abundant (although it may be rare in parts of its range). Not vulnerable in most of its range.

Columbian onion is a species of concern and grows on open mesic sites. Prior to Como Forest Health project surveys, there was only one known occurrence in the state of Montana. This occurrence was found on non-federal land. Part of the population has been replaced by a gravel pit and the remaining portion is being threatened by invasive species. All suitable habitats surrounding the population have been converted to agriculture ([http://mtnhp.org/docs/2010\\_Plant\\_SOC.pdf](http://mtnhp.org/docs/2010_Plant_SOC.pdf)). Surveys in the Como Forest Health project area identified six small populations of Columbian onion. Due to these circumstances, the Forest Botanist for the Bitterroot National Forest is presenting this species as a candidate sensitive species to be placed on the Regional Foresters sensitive species list.

### ***3.9.3 Environmental Consequences***

#### **3.9.3.1 Methodology**

The project area was surveyed in 2003 and 2010-2013 for rare plant species by the forest botanist and biological science technicians. General and intensive surveys were conducted in the project area. Table 3.9- 4 lists the habitats for rare plants found within the project area.

Montana Natural Heritage Program database, aerial photographs, spatial information, and Bitterroot National Forest records were reviewed to identify known rare plant populations in or near the proposed project area. The project area was also surveyed for habitat that might be suitable for sensitive plants or plant species of concern. The plant list and plant habitats reviewed before field survey is included in the project file. This document was based on this data and a table was compiled showing rare plant species that were known to occur within the project area or had the potential to occur in the area.

This Biological Evaluation was prepared based on presently available information. If the action is modified in a manner that causes effects not considered, or if new information becomes available that reveals that the action may impact rare plants in a manner or to an extent not previously considered, a new or revised Biological Evaluation may be required. Effects were analyzed based on soil disturbance and canopy cover.

#### ***Incomplete and Unavailable Information***

Since our knowledge of most of the species on the Bitterroot National Forest rare plant lists is limited, it is important to be aware that species may be found in areas outside of what is currently thought to be "suitable" habitat. Therefore, during the course of field surveys, plant species taken out of consideration due to distribution or habitat unsuitability were surveyed for cursorily.

#### ***Spatial and Temporal Context for Effects Analysis***

##### **Spatial Context**

The spatial context for the analysis of direct and indirect effects is National Forest within the project area with a focus on treatment units and associated activities because impacts to rare plants are more likely to occur where project treatments are planned. The cumulative effects analysis spatial bounds are the same as for direct/indirect effects.

##### **Temporal Context**

The temporal context immediately follows treatment until recovery of disturbances caused by project activities. The comparison of effects is based on the existing condition, which reflects the culmination of effects from past management. . The recovery of

individual plants and populations after disturbance is species-specific and may depend on the disturbance type and its effects to the microsite, the tolerance of the species to disturbance, and the species rooting characteristics (i.e. rhizomes, taproots, bulbs, and corms). Following project implementation, vegetation conditions may be suitable for some rare plant species to become established or expand their populations, while other species may take between 50 and 100 years before the tree and shrub canopy cover conditions that provide suitable habitat.

### **3.9.3.2 Connected Actions, Past, Present, and Foreseeable Activities Relevant to Cumulative Effects Analysis**

Fire suppression, logging, livestock grazing, non-commercial thins, invasive plant control, road maintenance and construction, trails have impacted rare plant populations within the project area. Livestock grazing, invasive plant control, and road maintenance are currently occurring and likely to occur in the future.

#### ***Non-Commercial Harvest***

Non-commercial thinning began in the 1900s on the Bitterroot National Forest. The objective of non-commercial thinning is to reduce the density of young, overstocked stands to improve tree growth and forest health. The conditions created after non-commercial thinning are not naturally produced, as you would see in a wildfire, disease, or insect mortality, and do not necessarily provide for suitable rare plant habitat. However, many of these stands prior to non-commercial thinning are very dense, allow very little light to the forest floor, and do not support a diverse understory. They do provide some suitable habitat for some species of listed rare plants after non-commercial thinning, species such as holly leaf clover.

#### ***Commercial Harvest***

Timber harvesting has occurred on the Bitterroot National Forest beginning in 1845. Most activities occurred after the railroad was built in the late 1800s. Timber harvesting decreases canopy cover and increases light to the forest floor. This may be beneficial for some sensitive species, but may have adverse effects for sensitive species that require canopy cover. Over time, changes in forest structure alter native vegetation and rare species habitat. In many cases, timber harvesting creates stand changes similar to wildland fire; however, the pattern and distribution of forest size classes has drastically shifted from historical patterns that were created under natural disturbance regimes (see vegetation report).

#### ***Fire Suppression/Wildfire***

Wildfire has been suppressed for much of the past 100 years. Impacts from conifer encroachment and succession have occurred and are continuing to occur in rare plant habitats (Keane and Parsons 2010; Heidel and Shelly 2001). Future wildfires or prescribed burns, if allowed, will likely reduce conifer and shrub cover in rare plant habitats and likely encourage the establishment of species that need open habitat (Keane and Parsons 2010; Heidel and Shelly 2001). Whereas continued fire suppression will likely allow further conifer encroachment and progression to more shade tolerant species, thus eventually resulting in a community type conversion.

Fire suppression activities reduce rare plant habitats when individual plants or the habitats are removed or trampled by heavy equipment.

***Livestock Grazing***

Livestock has caused some soil disturbance in trailing and congregation areas. Trampling of individual plants could occur, but is not expected to cause large decreases in the number of individuals. Invasive plant seed may be distributed by livestock, but is not anticipated to cause noticeable increases in invasion as demonstrated in the past. Impacts from livestock grazing should be minimal due to their limited access across the project area.

***Invasive Plant Control***

Invasive plant control activities will continue as described in the Invasive Plants Report. Current communication between the Botanist and the Range/Weeds staff regarding rare plant locations reduces or eliminates the threat of inadvertent spraying of rare plants.

***Road Maintenance***

Road maintenance will continue when needed. Removal of individuals is not likely to occur at the present because rare populations do not occupy habitat in close proximity to roads.

**3.9.3.3 Alternative 1 – No Action**

***Direct Effects***

There are no direct effects on rare plants under the no action alternative.

***Indirect Effects***

**Non-Commercial Units**

Under the no action alternative vegetation treatments would not occur. Woody fuel loads and forest canopy cover would be higher under the no action alternative. This would include conifer encroachment and increased vegetation competition by species such as grasses, forbs, and shrubs. Possibly habitat for species requiring more open areas could diminish as forest density continues to increase. This will likely reduce habitat for *Allium columbianum*, *mimulus ampliatus*, and *Idaho scapigera*, possibly reducing individuals and populations since these species need open area with a lot of light for habitat.

**Commercial Units**

Rare plant habitat were found for threatened species, endangered species, sensitive species, plant species of concern, and Forest plant species of concern in commercial units in the project area (Table 3.9- 4). Although the No Action alternative is not likely to adversely impact any potentially suitable rare plant habitat, there is a possibility that impacts may take place in the event of a large-scale mortality from bark beetle infestation. This event may create potential for high severity wildfire that damage soil properties and rare plant habitat and favor invasive plant spread.

**Prescribed Fire Units**

Prescribed fire would not directly or indirectly affect rare plants since it would not occur under this alternative.

**Roads**

No roads would be constructed under this alternative so there would be no effects on rare plants or their habitats.

***Cumulative Effects***

The extent to which rare plants and their habitat have been impacted by past management activities is unknown. It is probable that more suitable open habitat existed

prior to fire suppression activities, in which case continued fire suppression would result in more forest encroachment on the current existing open forest habitats. Reducing the sensitive and species of concern habitat further as time continues with no treatment or natural occurrence.

There was probably more suitable habitat prior to the introduction and spread of spotted knapweed and cheatgrass. Invasive plant spread may be attributed to many factors including wildlife grazing, road construction, timber harvest, recreational use, fire, and drought. However, it is still unknown what the status of rare plant populations were at the time so the impacts of any such activities on these populations would be speculative at this time.

Continued fire suppression with no fuel reduction activities in the Como project area could increase the risk that a more severe fire event would occur in the coming years. A more severe fire could contribute to further spread of spotted knapweed on drier, south and west-facing aspects and increase the risk of cheatgrass spread.

### 3.9.3.4 Summary of Effects

Alternative 1 (No Action) has no activities planned in areas where rare plant populations and potentially suitable rare plant habitat occur. Based on this information, we anticipate that implementation of the no action alternative “may impact individuals or habitat, but will not likely contribute to a trend towards federal listing or loss of viability to the population or species”.

**Table 3.9- 4: Potential Plants and Plant Habitat in the Como Forest Health Project Reviewed for Survey. The Effects Determination<sup>1</sup> is provided based on the presence of plants or their habitat and potential effects of Como Forest Health project activities.**

SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
THREATENED AND ENDANGERED SPECIES						
<i>Howellia aquatilis</i> Water howellia	Low elevation wetlands surround by deciduous trees.	SPECIES: No HABITAT: No	NI NI	NI NI	NI NI	NI NI
<i>Pinus albicaulis</i> White bark pine	Mixed conifer stands at treeline.	SPECIES: No HABITAT: No	NI NI	NI NI	NI NI	NI NI
<i>Silene spaldingii</i> Spalding's catchfly	Open mesic grasslands in valleys and foothills.	SPECIES: No HABITAT: No	NI NI	NI NI	NI NI	NI NI
<i>Spiranthes diluvialis</i> Ute ladies' tresses	Alkaline wetlands, swales, and old meander channels.	SPECIES: No HABITAT: No	NI NI	NI NI	NI NI	NI NI
VASCULAR SENSITIVE SPECIES						
<i>Allium acuminatum</i> Taper-tip onion	Grasslands and ponderosa pine.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Allium parvum</i> Dwarf onion	Grasslands and open ponderosa pine.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Athysanus pusillus</i> Sandweed	Vernally moist rocky areas.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH

SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
<i>Castilleja covilleana</i> Rocky Mountain paintbrush	Grasslands, ponderosa pine, and Rocky alpine.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Clarkia rhomboidea</i> Common clarkia	Open Ponderosa pine stands.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Halimolobos perplexa</i> Perplexed halimolobos	Grasslands, Sagebrush, and Open Ponderosa pine stands.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Heterocodon rariflorum</i> Western pearl-flower	Canyon seeps.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Idahoa scapigera</i> Scalegod	Vernally moist rocky areas.	SPECIES: Yes HABITAT: Yes	NI MIIH	MIIH MIIH	MIIH MIIH	MIIH MIIH
<i>Mimulus ampliatus</i> Stalk-leaved monkeyflower	Open seeps and vernally moist soil along slopes, cliffs, and streams from the valleys to the subalpine zones.	SPECIES: Yes HABITAT: Yes	NI MIIH	MIIH MIIH	MIIH MIIH	MIIH MIIH
<i>Mimulus nanus</i> Dwarf purple monkey flower	Grasslands, Sagebrush, and Open Ponderosa pine stands.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Penstemon lemhiensis</i> Lemhi penstemon	Grasslands, Ponderosa pine stands, and Sagebrush areas.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Penstemon payettensis</i> Payette penstemon	Grasslands, Ponderosa pine stands, and Sagebrush areas.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Trifolium eriocephalum</i> Woolly-head clover	Mixed conifer and Open meadows.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Trifolium gymnocarpon</i> Hollyleaf clover	Grasslands, Ponderosa pine, and Doug fir stands.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
NON-VASCULAR SENSITIVE SPECIES						
SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
<i>Meesia triquetra</i> 3-Angled threadmoss	Fens and Bogs.	SPECIES: Yes HABITAT: Yes	NI NI	NI NI	NI NI	NI NI

SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
VASCULAR SPECIES OF CONCERN						
SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
<i>Allium columbianum</i> Columbian onion	Found in moist swales along vernal ponds and streams in valleys.	SPECIES: Yes HABITAT: Yes	NI MIIH	MIIH MIIH	MIIH MIIH	MIIH MIIH
<i>Centunculus minimus</i> Chaffweed	Vernally wet, sparsely vegetated soil found around ponds, rivers, and streams in valleys and plains.	SPECIES: Yes HABITAT: Yes	NI NI	NI NI	NI NI	NI NI
<i>Penstemon flavescens</i> Yellow beardtongue	Open or wooded, often rocky slopes in mountains.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
NON-VASCULAR SPECIES OF CONCERN						
SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
<i>Phascum cuspidatum</i> Toothed Phascum moss	Found on dry soil in open areas among grasses or shrubs.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Pseudocrossidium obtusulum</i> Pseudocrossidium moss	Found on soil and calcareous outcrops 90 - 3,300 ft.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Sphagnum magellanicum</i> Magellan's peatmoss	Found along the edges of bogs or fens.	SPECIES: Yes HABITAT: Yes	NI NI	NI NI	NI NI	NI NI
FOREST SPECIES OF INTEREST						
SPECIES	HABITAT	PRESENCE	EFFECTS DETERMINATION			
			ALT 1	ALT 2	ALT 3	ALT 4
<i>Camassia quamash</i> Small camas	Found in wet meadows and along streams.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH
<i>Lewisia pygmaea</i> var. <i>nevadensis</i> Nevada lewisia	Moist meadows and Open forests.	SPECIES: No HABITAT: Yes	NI MIIH	NI MIIH	NI MIIH	NI MIIH

<sup>1</sup> Effects Determinations are: NI = No Impact

MIIH = May Impact Individuals or Habitat, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species.

LIFV\* = Likely To Impact Individuals or Habitat with a Consequence that the Action may Contribute Towards Federal Listing or Result in Reduced Viability for the Population or Species.

BI = Beneficial Impact

\*Trigger for a Significant Action

### 3.9.3.5 Action Alternatives – Proposed Actions/ Effects Common in all Alternatives

#### *Design Features and Mitigation Measures*

Design features and mitigation measures incorporated in the alternatives are listed in Table 2.2-5.

#### *Direct and Indirect Effects*

##### Non-Commercial Thin Units

Non-commercial units, that are not plantation units, will retain forest overstory. In these units the focus will be on retaining healthy large ponderosa pine and Douglas-fir trees while thinning out small diameter trees in the understory. Hand crews will thin the units without using heavy equipment. Soil disturbance will be minimal and limit invasive plant introduction and spread. Treatment in these units would benefit species that require open habitats by removing trees that are encroaching on populations of *Allium columbianum*, *Idaho scapigera*, and *Mimulus ampliatus* (Table 3.9- 2). Currently these plant populations are being shaded by encroaching conifers, which reduces the habitat quality for these plants that grow in open conditions. The silviculturist and forest botanist will designate the removal of encroaching trees to protect and enhance habitat characteristics for these plant populations.

##### Commercial Harvest Units

Timber harvest and yarding the trees from the forest causes soil disturbance removes vegetation, and alters rare plant habitat. In the Como Forest Health project, trees would be whole-tree-yarded to the landing. With whole-tree yarding, the tree crown is removed at the landing, which distributes the weight of the log as it is dragged from the forest. The buoyancy of the crown reduces the degree of soil compaction and disturbance but does not eliminate it. Harvesting would create soil disturbance as trees are dragged over the ground and across native vegetation. Tractor based and skyline harvesting would occur in units proposed for commercial harvest in action alternatives. Soil disturbance carries a higher risk of establishment, and if equipment is contaminated, it also has a higher risk of introduction of invasive species. Soil disturbance also exposes the dormant seed bank in the soil. The introduction and establishment of invasive plant species threatens rare plants, native plant diversity, and their habitats. Disturbance can become detrimental to sensitive and native plant habitat if it spreads invasive plant species. Populations of invasive plants do occur within the project area and could increase with logging disturbance and a more-open forest canopy (see invasive plant section). Habitat quality for rare plants could diminish if invasive plants increase in the project area, as most invasive plant species aggressively compete with many native plants (Olson 1999). As invasive species increases, cover of more desirable, but less competitive native plant species can be significantly reduced, sometimes by as much as 60 to 90 % (Duncan 1997). Rare plant species can be particularly vulnerable since their numbers tend to be lower. See the invasive plants section for further discussion of invasive species risks and project design features to reduce the risk of the spread of invasive species.

Known rare plant populations of *Allium columbianum*, *Idaho scapigera*, and *Mimulus ampliatus* will be buffered from harvest activities to protect populations from direct

impacts and limit indirect impacts to populations. Buffers are expanded beyond the actual population in order to protect habitat for future population expansion.

These treatments would not lead to the listing of sensitive species, given the small scale of treatment (~4% of acres commercially treated within the South Lost Horse Creek and Rock Creek Watershed), short duration of effects, protection buffers, and presence of habitat for these species found adjacent to the project area, within the watershed, and throughout the Bitterroot National Forest (Table 3.9- 4).

Harvesting activities disturb soil, which increases the potential for invasive plant colonization. Invasive plants can out-compete native plants and reduce sensitive plant habitats. However, design features and mitigation measures in the Como Forest Health project (Chapter 2) would prevent direct effects from the spread of invasive plants by preventing disturbance in sensitive species habitat, promoting revegetation with native plants, and reducing invasive plant populations. Buffers will not prevent invasive plants, that are already established in newly or past disturbed areas, from creating new sites within the buffer since invasive plants can disperse within the buffers. Although, buffers will help to limit the dispersal of invasive plants within the buffer zones, but would not be able to eliminate the chance of invasive plant dispersal.

#### Prescribed Fire Units

Prescribed fire is proposed in all action alternatives for most units. None of these treatments involve using heavy equipment because thinning and control lines will be done by hand. Ground disturbance will be minimal. Excess slash will be handpiled and burned. Two types of piles will occur in all action alternatives: 1) handpiles, that are 6-8 ft in diameter throughout the units, which will not be seeded, and 2) landings, where the majority of the piles will be placed in areas that had past disturbance and will be seeded and fertilized. Based on past observations, hand piles and landings have a high risk for invasive plant infestations. The high intensity burning of the confined area essentially sterilizes the soil and greatly inhibits native revegetation (Hebel, et al. 2009). Although invasive species are also inhibited by the lack of nutrients, they are better adapted to these sterile conditions, and once they are introduced, there are no natural barriers to prevent establishment and persistence of invasive plant species. These areas are priority for post-treatment monitoring and possible herbicide treatment. All slashed units, will be reviewed by the Fuels Specialist, Silviculturist, Botanist, and Wildlife Biologist to determine the need and type of fuel treatment. Fuels levels that exceed site characteristics there is a higher risk for high severity wildfire events in which logging and scattering would not be preferable.

Underburning will occur in most commercial thin units. This treatment will improve habitat conditions for *Allium columbianum* and *Idaho scapigera*. *Allium columbianum* and *Idaho scapigera* habitats were historically subject to periodic fires (Arno 1976), suggesting they are adapted to fires and may even depend on them to prevent forest canopy closure. Due to limited research on these rare species, there is little known about how they would react to prescribed fire treatments. Therefore, only a portion of one of the larger populations will be subject to a burn. We expect the populations will thrive after the burn is accomplished. A spring burn will occur when vegetation and soil moisture levels are high, thus preventing the spread of fire. Burning when soils are frozen or wet, as in the spring, have shown to protect the soil, leaving the duff layer largely intact, protecting the seed bank (Soils Report). Similar past treatments on the forest have found there to be no detrimental soil disturbance after such burns. See the Vegetation,

Fuels, and the Soils report for additional information regarding treatment prescriptions and effects. The reduction of conifers within the rare plant population could provide long-term benefits to the populations by reducing overstory cover and maintaining the open habitat required by the species, thus preventing the projected community type conversion predicted under the no action. The long-term maintenance of the open habitat would outweigh the potential short-term decrease in the number of individuals. New populations could also establish in newly opened areas elsewhere within the treatment units.

Prescribed fire underburning, may create areas of moderate to high intensity fire, but damage to habitat will not likely be long lasting. Recovery to soils from any moderate to high intensity fire will be within two to three years, if not sooner. There is potential for expanding invasive plants further into these areas when opening the canopy by thinning and disturbing the ground. Fuels treatments would maintain sensitive species habitat while reducing the likelihood of high severity wildfires. If a wildfire occurs without the proposed vegetation management activities, chances are the fire will be of such intensity it would cause more disturbance and bare soil, and a higher likelihood of invasive plant spread than would occur with a prescribed burn under controlled conditions. For patches with no native vegetation left for competition the invasive plant infestations could be worse than with a planned ignition under moister conditions. The trade-off is whether to burn under controlled conditions where most of the native plant community will be left intact, or risk the occurrence of a natural fire in the hotter summer months. In either case, spotted knapweed and other weeds are likely to increase, but spring burning, rather than fall burning, may lessen the risk of spread. Prescribed fires in the Como project area will most likely be done under cool conditions, which would reduce the fire severity and ground disturbance leading to invasive plant spread. As invasive plants increase and alter the native plant community the more difficult it will be to return the area to a pre-invasive fire regime (Brooks et al 2004). Prescribed fires proposed in the Como Forest Health project would reduce fuels and burn under controlled conditions. Though rare and native plants may be damaged during prescribed fires, some of the plant communities will remain intact and out-compete invasive plants. Natural fires in untreated stands have the potential of being high severity that would cause extensive damage to rare and native plants and favor invasive plant colonization.

#### Roads

All action alternatives propose treatments that will include soil disturbance (Table 3.9- 5).

**Table 3.9- 5: Summary of Soil Disturbances between Alternatives.**

ALTERNATIVES	SOIL DISTURBANCE FROM LANDINGS (ACRES)	SOIL DISTURBANCE FROM TEMPORARY ROADS (ACRES)	OVERALL SOIL DISTURBANCE FROM PROPOSED TREATMENT (ACRES)
Alternative 1	0	0	0
Alternative 2	27	2.88	132
Alternative 3	19	0	116
Alternative 4	17	1.65	113

Alternative 2 and 4 propose building varying amounts of temporary road construction in sensitive plant habitat. Populations of *Allium columbianum*, *idahoia scapigera*, and *mimulus ampliatus* are found in harvest units. There is a high potential that temporary roads and track line machine trails will be built near sensitive plant populations. Direct

effects to suitable habitat from temporary roads, would be the removal of vegetation, removal of top soil, and soil compaction. The construction of new road template removes vegetation, often putting it to the side of the corridor where it is left to decompose. Equipment compacts the soil creating a drivable surface. This construction removes the area from the productive landbase for the life of the road, preventing native vegetation to grow back. Generally, temporary roads are on the landscape for the life of the project and then blocked, reclaimed, and re-contoured at the end of the project. If the road is reclaimed via ripping and putting back the native surface or re-contouring, eventually native vegetation will grow back, if it is not outcompeted by invasive plants (soils report). If the road is left as is on the landscape without reclamation, vegetation will still grow back, but plant growth would be hindered due to soil compaction and lack of nutrition, and invasive plants will have the competitive edge in the harsher growing environment. Project design features placed for this project will eliminate those effects mentioned above.

Indirect effects on suitable sensitive plant habitat would include edge effects from road construction and changes to hydrology that support suitable habitat. Edge effects are described as an increase in light, temperature, and wind, as well as a decrease in humidity, and, in the case of roads, an increase in dusting (Trombulak and Frissell 2000). The extent of edge effects is difficult to determine, since it depends on the size of the adjacent opening/road corridor and the affected forest type, but it can extend from 15 feet to 50 feet (Watkins, et al. 2003). The effect on sensitive plants would be a change in habitat that could affect the diversity of the stand edge.

The proposed road based disturbance may adversely impact rare plant habitat that is adjacent to the road because the disturbance would be temporary (3-5 years), the effects may also be temporary. With time, habitat will recover as long as invasive plants do not become established. Monitoring invasive plant infestations and treatments would ensure potential habitat recovery. Design features would reduce the chance of infestations (Table 2.2-5). Known rare plant populations of *Allium columbianum*, *idaho scapigera*, and *mimulus ampliatus* will be buffered to protect populations from direct impacts and limit indirect impacts to populations. Buffers are expanded beyond the actual population in order to protect habitat for future population expansion.

### *Summary of Effects*

The proposed action could contribute to invasive plant spread in the project area by disturbing the soil and opening the forest canopy. Some increase in invasive plants, primarily spotted knapweed and cheatgrass, is probably unavoidable. However, the long-term benefits of returning the forest to a more historical condition and reducing fuel loads may outweigh undesirable impacts from invasive plant spread (Harrod 2001). Thinning the forest and underburning could reduce the risk of an intense wildfire in the future, reducing the risk of widespread soil disturbance and greater spread of invasive plants.

Due to design features applied to protect rare plants and their potential habitat found in the project area during surveys, there would be no direct and minimal indirect effects to these species. Therefore, implementation would not contribute to the listing of vascular plants and non-vascular rare plant species.

### *Cumulative Effects*

As human populations and development increase in this region, available habitat for rare plants would decrease. Management and treatment activities would continue to occur on private lands where there are no laws or regulations to govern management of listed

species, although plant species on federal lands would continue to be protected and conserved following policy and management guidelines.

The cumulative effects of the proposed action on rare plants are unknown. More suitable habitat for rare plants may have existed before fire suppression allowed tree density to increase. Invasive plants have also caused a decline in habitat quality. The Como Forest Health project area incorporates project design features for the protection of rare botanical species and habitat from project activities. These protection measures are also utilized for other projects throughout the Bitterroot National Forest. Due to these protection measures, rare plant species and potential habitat are protected from impacts and project activities, and will not trend towards extinction or extirpation. If Alternative 2, 3, or 4 are selected the cumulative effects of these additional activities are likely to continue invasive plant spread which may adversely impact some rare plant habitat. However, if project design features are implemented as described in Chapter 2 then these affects could be minimal.

### 3.9.3.6 Compliance with Forest Plan and Other Relevant Laws, Regulations, Policies and Plans

*Table 3.9- 6: Compliance with Forest Plan and other Relevant Laws, Regulations, Policies, and Plans.*

REGULATORY REQUIREMENT	PROPOSED ACTION
Bitterroot Forest Plan	The Forest plan has been followed by identifying and protecting rare plants in the project area.
National Forest Management Act of 1976	Diversity of species will be maintained by creating openings within the treatment units to allow early seral species to occupy.
Forest Service Manual 2600 Wildlife, Fish and Sensitive Plant Habitat Management	Manual 2600 directs the Forest Service to complete biological evaluations, analyze the significance of adverse impacts, and avoid or minimize impacts. This biological evaluation serves as the analysis of impacts and includes measures to avoid or minimize impacts to rare plants where feasible, and is therefore in compliance with the Manual direction.
Endangered Species Act	There are no federally listed plant species within the project area, therefore this project will not be jeopardizing any listed species and is in compliance with the Act.
National Environmental Policy Act of 1969	This document considers and analyzes the potential direct, indirect, and cumulative impacts to rare plants through a cause-effect analysis based on presence of species and the potential effects of alternatives. This analysis established that there are no extraordinary circumstances that would lead to further analysis and is therefore in compliance with the Act.